

CLAIMS

We claim:

1. A sputtering target, comprising:
 - a target surface component comprising a target material;
 - 5 a core backing component having a coupling surface and a back surface, wherein the coupling surface is coupled to the target surface component; and
 - at least one surface area feature coupled to or located in the back surface of the core backing component, wherein the surface area feature increases the effective surface area of the core backing component.
- 10 2. The sputtering target of claim 1, wherein the target material comprises a metal, a metal alloy or a combination thereof.
3. The sputtering target of claim 2, wherein the metal or metal alloy comprises a transition metal.
4. The sputtering target of claim 3, wherein the transition metal comprises copper,
15 aluminum or titanium.
5. The sputtering target of claim 1, wherein the at least one surface area feature comprises at least one concave feature, at least one convex feature or a combination thereof.
6. The sputtering target of claim 5, wherein the at least one concave feature comprises at
20 least one concentric indentation.
7. The sputtering target of claim 5, wherein the at least one concave feature comprises a dimple.
8. The sputtering target of claim 5, wherein the at least one concave feature comprises a plurality of linear channels.
- 25 9. The sputtering target of claim 5, wherein the at least one convex feature comprises a plurality of linear ridges or protrusions.

10. The sputtering target of claim 5, wherein the at least one convex feature comprises a bump.
11. The sputtering target of claim 5, wherein the at least one convex feature comprises at least one concentric ridge or protrusion.
- 5 12. A sputtering target, comprising:
a target surface component comprising a target material;
a core backing component having a coupling surface and a back surface, wherein the coupling surface is coupled to the target surface component; and
at least one surface area feature coupled to or located in the back surface of the core
10 backing component, wherein the surface area feature comprises a subtractive feature, an additive feature or a combination thereof.
13. The sputtering target of claim 12, wherein the target material comprises a metal, a metal alloy or a combination thereof.
14. The sputtering target of claim 13, wherein the metal or metal alloy comprises a
15 transition metal.
15. The sputtering target of claim 14, wherein the transition metal comprises copper, aluminum or titanium.
16. The sputtering target of claim 12, wherein the at least one subtractive feature comprises at least one concentric indentation.
- 20 17. The sputtering target of claim 12, wherein the at least one subtractive feature comprises a dimple.
18. The sputtering target of claim 12, wherein the at least one subtractive feature comprises a plurality of linear channels.
19. The sputtering target of claim 12, wherein the at least one additive feature comprises a
25 plurality of linear ridges or protrusions.

20. The sputtering target of claim 12, wherein the at least one additive feature comprises a bump.
21. The sputtering target of claim 12, wherein the at least one additive feature comprises at least one concentric ridge or protrusion.
- 5 22. A method of forming a sputtering target, comprising:
providing a target surface component comprising a surface material;
providing a core backing component comprising a backing material and having a
coupling surface and a back surface;
providing at least one surface area feature coupled to or located in the back surface of
10 the core backing component, wherein the surface area feature increases the
effective surface area of the core backing component; and
coupling the surface target component to the coupling surface of the core backing
component.
23. A method of forming a sputtering target, comprising:
15 providing a target surface component comprising a surface material;
providing a core backing component comprising a backing material and having a
coupling surface and a back surface;
providing at least one surface area feature coupled to or located in the coupling surface
of the core backing component, wherein the surface area feature increases the
20 effective surface area of the core backing component; and
coupling the surface target component to the coupling surface of the core backing
component.
24. A sputtering target, comprising:
25 an integrated target surface component and core backing component, wherein the
surface component and the backing component comprise the same target
material; and

at least one surface area feature that is on or integrated into the core backing component, wherein the surface area feature increases the effective component of the core backing component.

25. The sputtering target of claim 24, wherein the target material comprises a metal, a metal alloy or a combination thereof.
26. The sputtering target of claim 25, wherein the metal or metal alloy comprises a transition metal.
27. The sputtering target of claim 26, wherein the transition metal comprises copper, aluminum or titanium.
28. The sputtering target of claim 24, wherein the at least one surface area feature comprises at least one concave feature, at least one convex feature or a combination thereof.
29. The sputtering target of claim 28, wherein the at least one concave feature comprises at least one concentric indentation.
30. The sputtering target of claim 28, wherein the at least one concave feature comprises a dimple.
31. The sputtering target of claim 28, wherein the at least one concave feature comprises a plurality of linear channels.
32. The sputtering target of claim 28, wherein the at least one convex feature comprises a plurality of linear ridges or protrusions.
33. The sputtering target of claim 28, wherein the at least one convex feature comprises a bump.
34. The sputtering target of claim 28, wherein the at least one convex feature comprises at least one concentric ridge or protrusion.
35. A sputtering target, comprising:

an integrated target surface component and core backing component, wherein the sputtering target comprises a target material gradient; and

at least one surface area feature that is located on or integrated into the core backing component, wherein the surface area feature increases the effective component of the core backing component.

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36. The sputtering target of claim 35, wherein the target material comprises a metal, a metal alloy or a combination thereof.

37. The sputtering target of claim 36, wherein the metal or metal alloy comprises a transition metal.

10 38. The sputtering target of claim 37, wherein the transition metal comprises copper, aluminum or titanium.

39. The sputtering target of claim 35, wherein the at least one surface area feature comprises at least one concave feature, at least one convex feature or a combination thereof.

15 40. The sputtering target of claim 39, wherein the at least one concave feature comprises at least one concentric indentation.

41. The sputtering target of claim 39, wherein the at least one concave feature comprises a dimple.

20 42. The sputtering target of claim 39, wherein the at least one concave feature comprises a plurality of linear channels.

43. The sputtering target of claim 39, wherein the at least one convex feature comprises a plurality of linear ridges or protrusions.

44. The sputtering target of claim 39, wherein the at least one convex feature comprises a bump.

25 45. The sputtering target of claim 39, wherein the at least one convex feature comprises at least one concentric ridge or protrusion.